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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,380	07/06/2005	Motohiro Arifuku	1303.45151X00	8734

20457 7590 12/16/2009

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EXAMINER	
VIJAYAKUMAR, KALLAMBELLA M	
ART UNIT	PAPER NUMBER
1793	

MAIL DATE	DELIVERY MODE
12/16/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/541,380	ARIFUKU ET AL.	
	Examiner	Art Unit	
	KALLAMBELLA VIJAYAKUMAR	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 August 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 19-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 19-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/08/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

- Applicant's amendment filed with the arguments on 08/17/2009 has been entered. Claims 1 and 19 amended. Claims 10-18 were cancelled. New claims 20-25 were added. Claims 1-9 and 19-25 as amended are currently pending with the application.
- Applicants amendment overcomes the prior art rejections cited in the last office action, but moot in view of new grounds of rejection.
- The data submitted by the applicants in support of their claims has not given patentable weight, and it is suggested to submit any experimental results and conclusions in the form of an affidavit or a declaration under 37 CFR 1.132 for consideration.
- It is agreed that that applicants need not submit the priority document for JP 2003-181,593 (Res Pg-7) since the application was filed under 35 USC 371. However, the transmission by PCT filed 07/06/2005 does not indicate the transmission of this priority document under Rule 17.1 (a) or (b); and it is suggested that this deficiency in the application is corrected.

Claim Rejections - 35 USC § 103

- The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claims 1-9 and 19-25 are rejected under 35 U.S.C. 103(a) as obvious over Sony (JP 2001-189171) in view of Tsukagoshi et al (US 6,338,195), Suga et al (JP 2001-283637) and Kubota (JP 2000-208178).

- Claim-22 recites the optional limitation terminology of "if any", and Claim scope is not limited by claim language that suggests or makes optional but does not require steps to be performed, or by claim language that does not limit a claim to a particular structure [MPEP 2111.04 [R-3]].

Sony teaches an anisotropic conductive material in the form of a film comprising a dispersion of conductive films in an insulating binder (Claim-1). The insulating binder comprised of an epoxy resin such as epicoat and acrylic resin including hydroxyls (radical-polymerizable resin) (P-0010; 0036). The conductive particles in a specific example comprised of nickel plated benzoguanidine resin particles with a particle size of 5 microns (P-0036). The conductive particles were polymer particles of styrene, silicone, acrylic, and polyolefin and rubber particles surface coated with a metallic layer comprising one or at least two of Ni, Au, Ag, and Cu and like. The metallic layer had a thickness of 10-200 nm (P 0015-0016). The film thickness for gold was 10-30 nm. The composition contained photo/thermal curing agents such as imidazole, amine, acid anhydride (P-0011; 0036). The anisotropic composition further contained thermoplastic resin such as phenoxy resin (P-0013; film forming resin). The conductive particles had hardness of 1000-8000 N/mm2 (1.0-8 GPa) (P-0020). The specific conductive particles in an example had a particle size of 5 micron (0036) and 10 micron (0038). The passivation film 5 is adjacent and thicker than the electrode-4 and meets the limitation of the structure in the claims.

The prior art fails to teach the instant claimed hardness of the conductive particles or their particle sizes and the specific insulator layers per the claims-1 and 19.

In the analogous art, Tsukagoshi et al (US 6,338,195) et al teach the connection structures using anisotropically conductive adhesive films wherein the insulating layer 18 is made of silica, silicon nitride, polyimide, etc and to be functional equivalents (Cl-13, Ln 18-35). The adhesive films for the connection sheet had a thickness of about 20 micron (Cl-15 Ln 37-44).

In the analogous art, Suga teaches a anisotropic bonding film with a film thickness of 35 micron containing a dispersion of gold plated benzoguanimine resin/polystyrene particles with a particle diameter of 5 micron, a 10% compressibility E=4.7 GPA, and E'/E=0.0485 weight section with good electrical conductivity and with good connected state (Abstract; Claim-2, 4 P-0006, 24, 36). The GPA for the particle anticipates the instant claimed range in claim-1.

It would have been obvious to a person of ordinary skilled in the art to substitute the polyimide film in the structure of Sony with a silicon oxide/nitride insulation film of Tsukagoshi as functional equivalent with predictable results and reasonable expectation of success because the teachings are in the analogous art of connecting electrodes by interposing ACF between them; and further substitute the conductive particles of Suga as functional equivalent in the ACF film of Sony with predictable results and reasonable expectation of success, because the teachings are in the analogous art bonding electrodes; in obviously arriving instant claimed structure and conductive particles.

With regard to the properties after curing and the TG per claims 1, 6, and 24, and storage elastic modulus in claims 1 and 25, and mean coefficient of expansion per claim-1, the prior art composition and its components are similar to that claimed/taught by the applicants, and it is expected to possess similar properties, because where the claimed

and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

With regard to Claims 2-3, the combined prior art teaches polymers coated with Au with a shell thickness of 10-30 nm (P-0019) whose range overlaps with the instant claimed ranges and In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

With regard to Claims- 4-5, the prior art teaches polymers such as epoxy/epicoat and acrylic resin including hydroxyls and photo/thermal initiator/curing agents.

With regard to Claims- 7-8, the prior art teaches the addition of Phenoxy resin.

With regard to Claims-9, the prior art teaches a film.

With regard to the method claim-19, the combined prior art teaches connecting a semiconductor element having an electrode at a position lower than a passivation film to a circuit substrate having an electrode corresponding to the electrode, including an insulating adhesive component and conductive particles (Claim-1). The prior art teaches interposing the connecting material film between an IC chip with an Al electrode and glass/epoxy substrate with Cu-electrode and thermally bonding at 180C and 150N forming an electrical connection through the particles (P-0036; Fig-1).

With regard to Claim- 20, the combined prior art structure obviously meets the structural configurations.

With regard to claim 21, it would have been obvious to a person of ordinary skilled in the art to form insulation layers in both the bonding layers with a motivation to simplify the process and minimize the cost of production over the teachings by Tsukagoshi that teaches insulating layers between the electrodes (C l-1, Ln 30-39, Fig-7 and Fig-8) so that unnecessary portions of the substrate are covered with insulating layer because it would be unnecessary to form costly protruding electrodes on the chip thus reducing the cost (Cl-13, Ln 30-39).

With regard to claim 22, the instant claimed thickness of the silicon nitride/oxide insulation films in the modified structure of Sony would have been obvious to a person of ordinary skilled in the art over the teachings of Kubota that teaches a thickness of 400 nm silicon nitride film (0030, 0032) in bonding electrodes in a semiconductor device using ACF films (Abstract) that was well known in the art at the time of the disclosure of the invention by the applicants.

With regard to claim 23, the prior art teaches a film size of about 20 micron, and prima facie obvious (0037).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KALLAMBELLA VIJAYAKUMAR whose telephone number is (571)272-1324. The examiner can normally be reached on M-F 07-3.30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 5712721358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KMV/
December 03, 2009.

/Stanley Silverman/
Supervisory Patent Examiner, Art Unit 1793